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The JOURNAL of GEOGRAPHY

VOLUME XLVII DECEMBER, 1948 NUMBER 9

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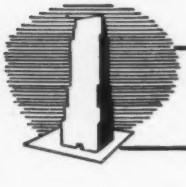

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VOLUME XLVII DECEMBER, 1948 NUMBER 9

GEOGRAPHIC CONDITIONS IN BREATHITT COUNTY, KENTUCKY

WILLIAM C. STEELE
Lecturer in Geography, Stanford University

The Southern Appalachian hill lands have been, since the latter part of the Nineteenth Century, widely publicized as a region of relative poverty, economic backwardness, and social retardation. Since that day, the region generally has made noteworthy advances along social and economic lines. Indeed, some areas have witnessed amazing progress in human well being. Many areas, however, have remained practically at a standstill, while a few have actually retrogressed. In this last category, stand several portions of the hilly area of eastern Kentucky. Breathitt County affords a striking example of stationary, if not indeed actually retrograding conditions.[1]

THE REGION

The County is situated in one of the more maturely eroded portions of the Cumberland Plateau. The streams have so thoroly dissected the area into a maze of ridges that none of the original upland remains. At the same time, little level lowland has been formed, save for narrow strips along the larger streams—notably the two forks of the Kentucky River. To make matters worse, the area is walled in from the Great Valley on the east by several hundred miles of barrier ridge. On the west, it is separated from the rolling limestone plains by a rugged escarpment.

During the latter half of the Eighteenth Century, English and Scotch-Irish colonials began to trickle into the area. They laid claim to extensive tracts of land, hacked down patches of tangled wilderness and built crude log cabins. These newcomers found a

[1] This paper is based upon residence in Breathitt County, during 1941-'42, and field work done there during 1946-'47.

variety of natural assets. A magnificent hardwood forest covered ridge and valley alike. Well-trod buffalo trails were in evidence, black bear and white-tailed deer were numerous, and gray and red squirrels, rabbits, turkeys, small game birds, and fish were amazingly abundant. Such fur bearing animals as fox, raccoon, skunk, mink, opossum, and muskrat were plentiful. Surface outcrops of coal were noted by Christopher Gist as early as 1750.[2]

EARLY ADJUSTMENTS

The early settlers eagerly took to tilling the soil in Breathitt County. It was in the quite limited and narrow bottom lands that they found fertile land with acreage enough for a patch agriculture. Generation after generation hacked at the forest, clearing a piece here and a piece there. They cut firewood, hunted the wild game, drank corn whisky and home-made brandy, sometimes fought savagely amongst themselves, and exhibited unusual proficiency at begetting a numerous progeny.

Indian corn was the principal crop of early days—a crop well suited to the narrow strips of bottom land, then adequate for the limited population. Only a little wheat was grown, most of the bread being made of corn meal. After corn, the important food crops were white potatoes, sweet potatoes, beans, peas, and turnips. As early as 1839, some 2,648 pounds of tobacco were produced. In that same year, cotton (a crop not produced at all today) was grown to the amount of 4,270 pounds. Most of this cotton went into the home industries of mattress and quilt making.

Thruout its early history the rugged terrain made it necessary for the people to depend solely on "natural highways"—paths along the streams or crude craft upon the rivers in time of high water.

The two forks of the Kentucky were navigable only during certain months of the year when the volume of water was sufficient to float the logs and flat-bottomed boats over the numerous obstructions. Most of the early exports were in the form of logs, and a "log-run" was usually the climax of the timber-cutting season. One high water each year ordinarily would bring down most of the previous season's production. During these highwater periods,

[2] Workers of the Writers' Program of the WPA in the State of Kentucky, *Breathitt: A Guide to the Feud Country*, Bacon, Percy and Daggett Publishers, Northport, N.Y., 1941.

merchants transported their products, usually staves, ties, and ginseng root, on the raftlike boats out to the Bluegrass for sale.

EXPLOITATION AND DEPLETION

This comparatively carefree, humdrum, and uncomplicated way of life remained practically unmolested for about a century. Moreover, the natural resources, which to the untutored hillsman seemed inexhaustible, were relatively untouched until the coming of the railways into eastern Kentucky. The early settlers regarded the forest as a barrier to agriculture, but they cleared merely the

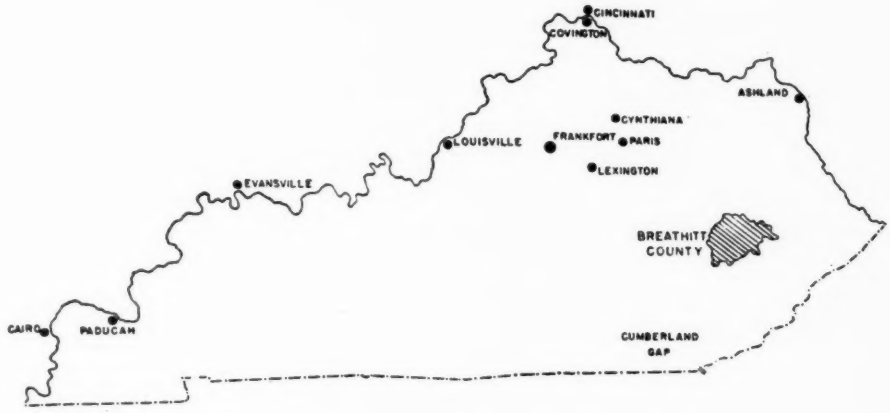

FIG. 1. Orientation map, showing Breathitt County in relation to Kentucky as a whole.

bottom lands. It was only as population increased and the supply of wild game decreased that land clearing was pushed up the hillsides. Most of the soils are light gray to yellowish sandy loams derived from sandstone, markedly deficient in lime and humus. Hillside soils are thin and wash badly when cultivated, becoming valueless in a short time. Leaching and washing are year-round processes owing to the abundant and fairly evenly distributed precipitation. In less than a century these processes began to overtake and triumph over land clearing.

Since the first settlement, small amounts of coal have been "stripped" and used occasionally in the mountain home in place of wood. It has been marketed "down the river" since the thirties of last century. Three thousand tons valued at $9,000 were sold in the year 1835. The census of 1860 credits the county with a pro-

duction valued at $7,550. By 1854, the Kentucky Geological Survey had studied the coal seams, and noted that the extensive trade in the commody was supplying the bulk of the ready cash circulating there. Farmers did most of the mining in the autumn and winter when they were not busy tilling the soil, and it was not until the entry of the railroad in 1891 that mining became something more than a sideline. With its coming, small companies were formed and rather extensive tracts of coal lands were leased or purchased. Shortly after, Breathitt became one of the leading Kentucky counties in coal production; but the position lasted only for a short period, as the thin seams soon proved uneconomical to work in competition with richer mines elsewhere.

The quickening tempo of the machine age not only disrupted many old habits and customs, but also the economic foundation of the agrarian economy, with resultant repercussions continuing even to the present day. Within a decade, more modernization took place than in the county's entire span of previous history. Coal mining and lumbering boomed in an extractive orgy. The extravagant use of these resources and depletion of the land was somewhat typical of frontier excesses everywhere. Much wealth was gotten out of the hills but only a little trickled into the pockets of the local people. The agents of the coal and timber interests who had penetrated the region before the coming of the railway had in many instances purchased land from the backwoodsman for as little as a dollar an acre. ". . . prodigal exploitation and naive optimism characterized the closing years of the nineteenth century . . . but the high expectations did not bear fruit—nor were the benefits of the new prosperity ever widespread. The twentieth century came in Breathitt while the ruthless hand of the nineteenth was still scouring its hillsides for marketable timber and gouging in its hillsides for coal."[3]

Then came the inevitable reckoning—the exploitive frontier had swept over the county and moved on southeastward. Behind it lay denuded and soon to be eroded hillsides and gaping mouths of mines unworked since the beginning of exploitation of the more profitable beds to the southeast. As the ephemeral prosperity passed, it left in its wake a poorer county with a more than doubled population.

[3] *Ibid.*, p. 7.

PRESENT CONDITIONS

Yesterday's folly has not only left its impress on the natural landscape but also on the myriad aspects of the social environment. Today, one witnesses woeful maladjustment in all forms of economic production. Subsistence agriculture, unscientific timbering, vanishing wildlife, marginal mining, practically no manufacturing, and little trade characterize the county.

Agriculture. In 1940, 70 per cent of all employed residents of the county were employed in agriculture. The county has never been,

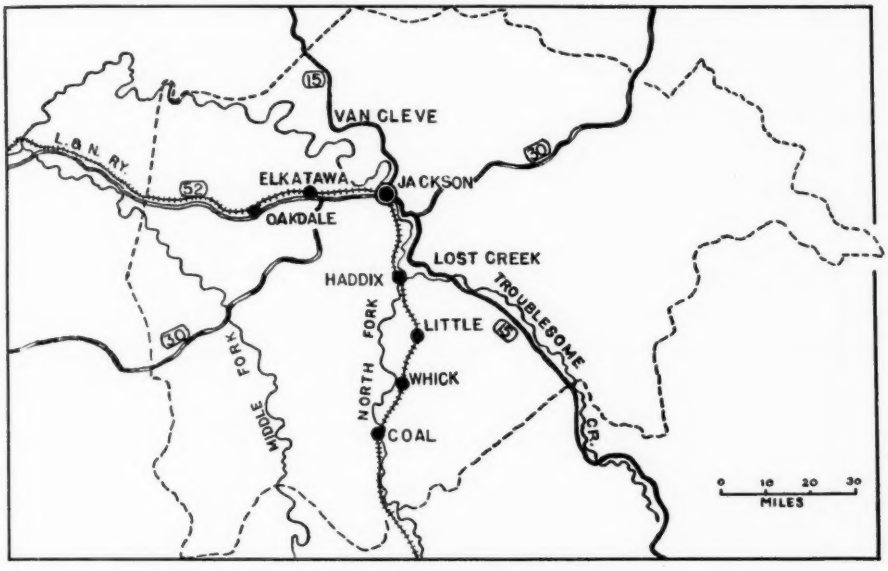

FIG. 2. Breathitt County, Kentucky.

and perhaps will never be, well adapted to this activity, and farming is largely of a subsistence or general type with production mainly for home consumption. The cultural traits of the people most certainly play a part in the agricultural pattern, but the dominant role is undoubtedly played by the physical setting, especially by soils and topography.

Improved methods of agriculture tend to develop gradually everywhere; in Breathitt County this process had been a little less than gradual until the 1930's, when some progress was made thru the combined efforts of the Federal Government and the State Agricultural Extension Service. Corn has always been the dominant crop—possibly no other easily grown crop today could sup-

port so many people, even at the subsistence level; but it is the nature of corn to take much and return little or nothing to the soil, and to invite erosion, especially where the land is steep. The unschooled farmer cares little for contour plowing; and with cultivation in the spring and summer and exposure to the relatively heavy showers, severe erosion is a natural consequence. After the harvest, the more or less bare ground is exposed to the winter rains, and to freezing and thawing which continues the erosion cycle, retarded only by the dead roots and weeds. And, so long as corn remains the dominant crop, irreparable damage from erosion is inevitable.

Even tho these conservative farmers tenaciously hold to their favorite crop, recent years have witnessed an increasing number of them reporting soil conserving ones. Only 15 reported planting clover or lespedeza in 1934, while 104 reported such planting in 1939. The corn acreage has remained relatively stable for the past several decades, fluctuating between 25 and 30 thousand acres a year, and seldom covers under three-fourths of the cultivated land. In 1939, Breathitt averaged less than 17 bushels per acre—the nation a little less than 30, Iowa nearly 55—a reflection of the poor soils and general agricultural backwardness.

Farm Size, Tenure and Income. There has been a gradual increase in the number of farms since the early days, the average farm decreasing in size from 75.6 acres in 1930 to 67.8 in 1940. The average value of farm land and buildings in 1940 was $13.25 per acre, and only $78,000 worth of farm implements and machinery was reported in the entire county. There were approximately 27 persons to each horse, 13 to each mule, nearly four to each cow, and three to each hog—a rather limited livestock holding for a rural county of some 24,000 persons.

In 1939, white tenants worked nearly one-half of the cultivated land (only three farms, totaling 67 acres, being operated by nonwhites). In 1930, 39 farmers had automobiles, eight had motor trucks, but not one had a tractor; in 1940 the number of automobiles had risen to 114, trucks to 87, but still no tractor was reported. It is significant to the agricultural picture that in 1939 there was purchased only 69 tons of commercial fertilizer in the entire county. "In the county in 1939, the average value per farm of all agricultural products sold, traded, or used by the operator's family was $284.00, of which 80 per cent was accounted for by the value of

products used.'"[4] In other words, in 1939, the average farm produced for the operator $227.00 worth of consumable agricultural produce, and $56.80 in cash. In 1941, the net cash farm income of an average group of farm families averaged $41.00.

Agriculture here cannot possibly support the farm population adequately, even with supplementary income from employment on public works, and in the meager industrial and commercial activities of the county. Limited arable land, soil depletion, erosion, and inefficient farming methods have combined in the past to produce only a subsistence level of living, and efforts to increase the arable land has only led to a greater number of eroded hillsides. A marked increase in the productivity of the small amount of fairly good land is unlikely.

Wildlife Exploitation. The poverty of the people has been instrumental in almost exterminating all forms of wildlife. The ranks of the fur bearing animals have been severly decimated, and only occasionally can a deer be seen; rabbits and squirrels have fared only a little better, while all forms of aquatic life have practically disappeared. Any idea of the conservation of wild animal life, and indeed conservation in general, is totally foreign to these hill-folk.

Forestry. The reckless exploitation of the forest, which began with the coming of the railway, continued unabated until the early twenties when the supply of marketable timber became exhausted. The tree cover is slowly becoming reestablished, but owing to the extravagant cutting practices thruout the county's logging history, the present low-grade forests are of relatively little value. Fires have regularly played havoc with this resource, and even today the scorched and smouldering hillside is a common sight. These low-grade cut-over forests still occupy seven-tenths of the land, and provide at least one avenue toward a reorganization of the marginal economy.

The forests provide employment for only one per cent of the population, and support only a few small, scattered and inefficient processing plants which have little contact with the outside market. The timber is of such inferior quality that much of it is unable to bear the cost of expensive transportation, and hence the distance it can travel to market is severely limited. The species most in demand occupy only a minor place in the stand, whereas the ma-

[4] Kentucky Agricultural Experiment Station, University of Kentucky, *Timber-Products Marketing in Eastern Kentucky*, Bul. 488, June, 1946, p. 13.

jority of the trees are of less desirable kinds. In 1944, the net sawlog volume was: beech 27 per cent of the total, black oak 12, hickory 11, scarlet oak ten, northern red oak seven, with most of the remainder consisting of white oak, chestnut oak, yellow poplar, black gum, and short leaf pines.

In recent years, well over 90 per cent of the timber cut was shipped out of the area. Louisville today receives the bulk of veneer logs, most of the staves, and a large portion of the ties. A considerable part of the production moves thru Cincinnati, Ashland, and Huntington. World War II brought a tremendous increase in timbering in the County, in striking contrast to timber production in other areas of the nation. This shows clearly that Breathitt's is a marginal position in the market. The products were mostly rough or unfinished and entered the market mainly as a raw material destined to be further processed.

The exhaustion of the county's forest resources is a striking example of near-sighted profit seeking in the present national economy. It is said to require some two hundred years for the maturity of most of Kentucky's hardwood species, but that the forests may be cut over every sixty years without harm provided it is done scientifically. Altho the Breathitt County section of the region stands near the lower end of the scale with respect to economic conditions which encourage timber processing and marketing, and altho it has been one of the most ruthlessly exploited areas, nevertheless these practically destroyed forests hold some hope for the future. In fact, it offers potentially one of the few hopes for such a thoroly ransacked area. The ragged character of the residual timber attests to the shortsightedness of those who sold this natural resource for a pittance to the lumber companies, which moved in, denuded the hills and hollows, and then moved on to richer and more productive areas.

Mining. In mining, as in timbering, the county has seen its best days. By 1934, it had dropped to nineteenth place among twenty-two coal producing counties in the state. There was an upward surge of production during the First World War, and the subsequent "boom" days of the twenties, with the annual production reaching 208,000 tons in 1929—another evidence of the county's marginal productivity. In 1944, the total production had fallen, despite demands of the Second World War, to 51,000 tons, 48,000 tons being produced by the two "railway" mines, and 3,000 by

four small "truck" mines. Today, as in the past, individual farmers "dig" a little for the local market and for home use. The discovery and mining of the more profitable coal measures in the state, and thruout the nation, has almost nullified the commercial importance of Breathitt County's thin seams.

There has been in the past a small production of petroleum, but there is none today. There is a little natural gas, some having been

FIG 3. Small sawmill in foreground, farm in background, corn on lower right hand slope. Note young trees invading former field on the steep left hand slope. (Courtesy University of Kentucky.)

recently piped to Jackson, the county seat. In the early days, salt was produced, and one of the most important works in eastern Kentucky was located on Troublesome Creek. This industry did not die out completely until the coming of the railroad. Local sandstone of inferior quality is used today to a limited extent for bridge abutments and for rough construction. A new and much used county jail was constructed several years ago of this material. In both the Middle and North Forks of the Kentucky River there are small quantities of loose sands suitable for concrete construction. In mining extraction, however, as in most other fields of endeavor, there is little promise of more profitable days.

Manufactural and Commercial Enterprise. In 1940, the only manufacturing concern in the county was a small stave company located on Quicksand Creek about three miles from the county seat, and this was engaged in the production of tobacco poles and white oak staves for whisky barrels. The first sawmill was reported in 1840, but since then the number has fluctuated greatly, reaching a peak in the first decade of this century—rising with each "boom" and war, and falling when the demand for marginal timber subsided. World War II was instrumental in reviving this industry, so that by the end of 1942 there were some 50 circular sawmills, a stave mill, five planing mills, and three woodworking shops in operation. All the sawmills were owned and operated by individuals, with the exception of the three larger and more efficient ones which were corporation owned. Sawing costs were low because the wages paid were the minimum possible under the Wage and Hour Law, and because the crews, consisting of from eight to 14 men, were for the most part semi-skilled. The three woodworking shops produced chairs, tables, cabinets, bedsteads, and other simple furniture, primarily for local use.

The 1940 census lists but one drug store in the county, two hardware stores, eight gasoline filling stations, and 107 general stores, with these latter doing the bulk of the county's business. Here the checker-playing, tobacco-spitting contests of the past are still holding their own against all innovations of today. There is no hurry and bustle in Breathitt's business establishments, as the casual customer probably comes as much for the visit as for the purchase.

Living Conditions. The homes in the county today are not only substandard but bear a marked resemblance to the dwelling of the pioneer. There are still a few log cabins, some even with chinked wooden chimneys; but most of the houses are constructed of rough, knotty, and unfinished slabs—the unmarketable refuse of the timber-cutting era. The usual foundation is of upright logs inserted into the ground with braces cris-crossing between them; tin or roll composition roofing is the usual covering. Even today, a few of the cabins do not have glass windows, and it is not unusual to see the boarded inside walls papered with the leaves of mail-order-house catalogs. Until relatively recent years, there was no modern convenience in the way of light, heat, or sanitary plumbing in any farm house in the county. According to the housing census of 1940 approximately half of the owner-occupied dwellings, and two-thirds

of the tenant-occupied ones, were in need of major repairs. Only 16 per cent of the rural farm homes had a radio; of the 4,038 houses in the county only 47 were electrically lighted, 28 had mechanical refrigeration, and 25 had ice refrigeration, 20 had running water, while only 13 had a bath with flush toilet. Of the 832 rural non-farm dwellings in the county, only 170 were equipped with bath. Stoves had in large measure replaced the fireplace, altho three-fourths of the rural farm units still cooked with wood. The average value of the rural farm homes (over 80 per cent of all the dwellings in the county) was only $359.00 in 1940, with an average estimated monthly rental, where tenant-occupied, of $2.45.

Most of the people of the nation have not had the pleasure of visiting in one of these rustic homes, nor the experience of sleeping on a pioneer type of bed, often with a mattress made of corn shucks. In this northward jutting extension of the area of hominy, salt pork, and cornbread diet, however, they can readily experience it. A few chickens, a pig or two, and a scrawny cow usually adds a little life and movement to the somber scene. Birth and death in the remote hollows is still strictly a family affair in which certificates have no part. On the sides of the hills, a little above high water mark, these people live their lonely lives, uneducated, uninterested, unaware in large measure of the dangerous and clashing interests, national and international, which are rampant in the world today.

Education. Of all the mal-adjustments of men to this niggardly environment none is more appalling than the educational. When the magazine *Occupations* made a survey in 1936, only 25 of the 105 schools in the county could be reached by automobile. Of the 2,443 children who either finished or left the elementary schools between the school years 1931 and 1936, only 362 enrolled in the one high school, or roughly one out of seven. According to a survey made in 1945 by the College of Education at the University of Kentucky, 38 per cent of the population 25 years old or older have had four years or less of schooling. In 1945, the median educational level of the 20 to 24 year old group in Massachusetts was 12.1 years, Kentucky 8.8 years, Breathitt County 6.2 years. And inter-county comparison within Kentucky will perhaps throw a little light on the situation: Fayette County, less than one hundred miles away, had a general levy of $.70 per $100.00 of property subject to school tax. Breathitt at this time had a general levy of $.75. The resulting tax return, however, amounted to $44.79 per census pupil in Fayette, but to only $3.56 per census pupil in Breathitt. One

county is uniquely fertile, well located and has an efficient transportation system—the other is markedly infertile, rugged, isolated and has an extremely poor transportation system.

Roads and Transport. School absenteeism, thru no fault of pupil or parent is one of the most perplexing school problems facing the county. The rough topography and consequent rapid run-off of the

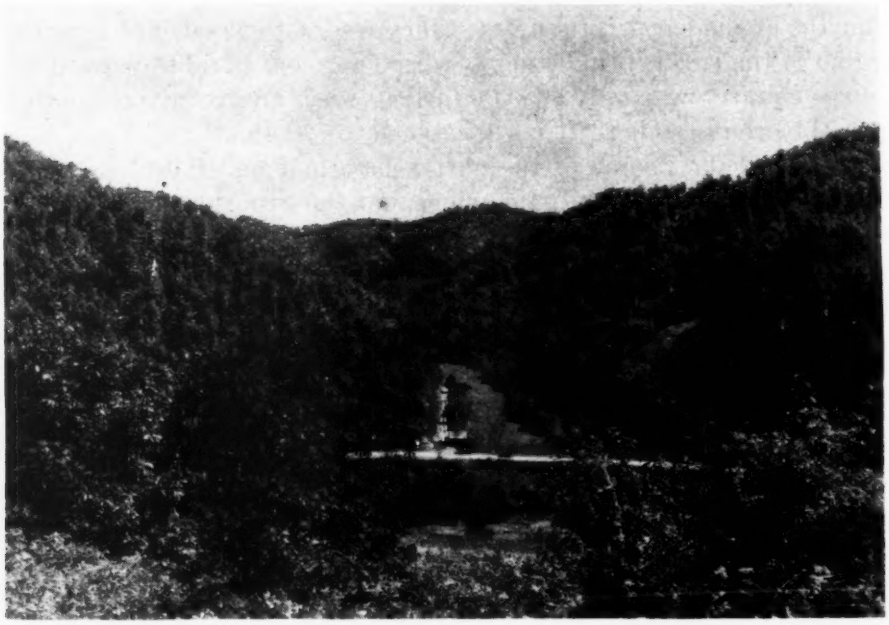

FIG. 4. Typical view of maturely dissected Cumberland hill county, showing Breathitt County's only paved road in the foreground. Note long shoestring farm in the valley bottom. (Courtesy University of Kentucky.)

rains, with resultant overflowing streams is the major factor in this problem. "During a large part of the year creek-bound communities still are marooned by the mud and by the unbridged, swollen streams that vein the countryside."[5]

It is only in more recent years that Breathitt's roads have become something more than trails. Even today, only one poorly paved bituminous highway crosses the county. There is a stretch of some 40 miles of gravel, while most of the remainder consists

[5] Workers of the Writers' Program of the WPA in the State of Kentucky, *Breathitt: A Guide to the Feud Country,* Bacon, Percy and Daggett Publishers, Northport, N.Y., 1941, p. 4.

of unimproved dirt roads, on which are located over 80 per cent of the county's farms. Of the 3,462 farms in 1940, 2,678 were on such roads, while in Fayette County only eight out of a total of 1,063 farms were so situated. Certainly one of the reasons for backwardness is the slow and hazardous means of travel. The first roads were sponsored and managed by the county court which allowed able-bodied men to do a certain number of days of road work each year to defray their taxes. Even today, this ancient system is still in operation in some sections, a circumstance which at least partly explains the transportation problem. There are still communities where wagons and automobiles have to be abandoned for the greater part of the year in favor of sleds and horses or mules. A few of the more isolated communities cannot be reached by roads, but instead are served by bridle paths and sled trails. The Kentucky State Highway Department reported in October, 1946, that 80 per cent of the county's roads are considered impassable during the winter months.

The arrival of the railroad in 1891 more effectively penetrated the isolation than all of the previous river improvements and summer roads, and it ushered in the unrestrained exploitive era which was to last some three decades. The railway, now a part of the Louisville and Nashville system, operates 36 miles of roadbed in the county and is the source of a large portion of the county's cash income. The principal commodity hauled over the line today is coal, not from Breathitt, but from the counties farther to the east.

Lack of good transportation and lack of economic opportunity are twin evils, each fostering the other. Lack of transportation fosters the cultural and economic isolation of not only families but of whole communities. This condition has left its mark on the physical, mental, and moral development of the people, with a concomitant lowering of economic efficiency. Here isolation has fallen most heavily on the preponderant farmer class, and has gone far in determining farm economy. Until a better transportation system is provided, there is little likelihood of a marked change in agricultural practices or of a rise in standard of living.

Overpopulation. Overpopulation is today one of the county's more acute problems, and this, when coupled with the so-called "rugged individualism" which is characteristic of most of these descendants of English and Scotch-Irish ancestry, becomes almost

sinister. Altho 49 persons per square mile is rather sparse when considered as a statistical expression of density, it is obviously excessive population density when considered in relation to Breathitt's economic opportunities under prevailing conditions. The population net increase had followed a steady upward curve until the advent of the period of exploitation induced by the advent of the railroad, whereupon it exhibited an abnormal rise. During the 1920's, this unward trend was sharply interrupted by a lessening of employment in the county, and second, a tremendous expansion of industrial employment in states to the north of Kentucky. The "depression" of the 1930's, however, reversed the trend. Industrial "layoffs" in Ohio, Indiana, and Michigan drove the emigrants back to Breathitt, and whereas the county's net population had increased less than three per cent during the 1920's, it jumped some 13 per cent during the 1930's.

The county, of course, offered these returnees no escape from poverty. It merely offered them a kind of poverty with which they were familiar—a type quite unlike that which they had seen in the slums of the industrial city. There was the garden patch with vegetables in season, the antiquated grist mill to grind the stunted corn of the hillsides, and kinsfolk to visit when the larder was bare. There was the old accustomed way of life, a sub-marginal existence in an unyielding environment from which they had tried to escape.

In 1940, some 70 per cent of all those who were gainfully employed were at work in agricultural pursuits. This amounted to nearly four times the national average. Only two per cent was engaged in manufacturing—about one-twelfth the national average. Seven per cent was engaged in mining, and one per cent in forest work.

It is obvious that the economy of this hill country is largely a closed one, for a large proportion of its production is used within the county, and relatively few things are brought in from without. In normal years of late, practically nothing has been processed for sale outside the county. On the whole, the people live mostly from the soil, consuming its production. Development of local industry has potentialities, but must be regarded as merely one of the several possible solutions, rather than as the single answer to the many economic ills. It is unlikely that industry will be able to absorb any appreciable portion of the growing population, or to

raise the per-capita income noticeably. Coupled with an extreme shortage of both capital and efficient management, is the lethargy of the people—people who are ignorant, malnourished, almost destitute, but apparently still satisfied, in the main, with the ways of living developed by their forebears.

PROSPECT

One might conclude from the foregoing discussion that there is little prospect of a more abundant life for these hillfolk so long as they remain in this poor environment, and so long as isolation and poverty continue to be barriers to any extensive emigration. Such a conclusion, however, would overlook several essential geographic realities.

There is still much wealth in Breathitt. A reasonable and modest scientific program of conservation and utilization of natural resources, of education and agricultural retraining, might provide fairly adequately for the present population. It is a fact, however, any such modest program is beyond the means of the county's few well informed citizens who would like to see something done about the deplorable state of affairs. Those who have witnessed the transformation in many parts of the Tennessee Valley know that vast improvement is possible, and they hope that some similar miracle may come to eastern Kentucky. The rehabilitation of Breathitt County and other similar parts of the Kentucky hill country is a job too big for the counties or the state alone to tackle; it will require the planned cooperation of the nation.

There are many aspects of the total problem, and hence many partial answers may be given. Readjustments in land use, better farming methods, abandonment of the poorer farmland, acquisition of much of the area by the Federal Government with subsequent reforestation, scientific operation and management of the mines, greater State and Federal aid to the schools, emigration to other areas, and a host of others might be suggested. Possibly a combination of all these approaches might prove profitable.

One of the most noticeable traits of Nature is the partiality with which she bestows her gifts—gifts which in the case of Breathitt are unlikely to produce, under the existing economy and present state of the arts, anything in the near future other than marginal existence for a thwarted people.

THREE MAPS OF PALESTINE

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Few small areas have played as noteworthy a role in world history as has Palestine. No comparable area within recent years has caused as much and as prolonged disturbance in world relations. The importance of this country becomes rather impressive when viewed in the light of its relatively small size. A Biblical journey "from Dan to Beersheba" was a mere one hundred and forty miles; from Joppa to Jericho less than fifty miles. Despite its small size, many sober students of international affairs believe that Palestine may, sooner or later, provide a crucial test of the workability of the United Nations organization. There are herewith offered, therefore, three maps of Palestine which are essential to any understanding of the drama being currently played in that area.

Physiographic Palestine

Palestine is a fairly well defined physiographic unit lying between Egypt and Syria. It includes four main divisions: the Coastal Plain, the Central Highlands, the Rift Valley, and the Trans-Jordan Highlands (see Fig. 1).

The Coastal Plain. The Mediterranean margin of Palestine is a low coastal plain varying from three to thirty miles in width. The bold ridge of Mt. Carmel divides the plain into two parts. The northern section is narrow and indented by the Bay of Acre. Behind this, however, is an extensive riverine lowland, the Plain of Esdraelon. Numerous springs rendered this latter highly malarial until it was drained by Jewish colonists after the First World War. There is now a flourishing agriculture on the rich alluvial soils.

Immediately south of Mt. Carmel the coastal lowland is known as the Plain of Sharon. Farther south it is called the Philistine Plain. The former is heavily populated by Jews, the latter chiefly inhabited by Arabs. The entire coastal plain above Gaza is predominantly agricultural. It is here that most of the citrus crop, Palestine's principal export, is grown. South of Gaza, nomadic grazing holds sway.

The Central Highlands. The Central Highlands are a fairly continuous line of uplands extending southward from the Lebanon Mountains. South of Tyre, the Lebanons decline to hill-country proportions and are known as the Hills of Galilee. The inhabitants

are poor and backward, and this area is the only portion of the country which has lost population within recent times.

South of the Galilean uplands and separated from them by the Plain of Esdraelon are the Hills of Samaria. These latter consist of a jumble of hilly knolls and ridges interspersed with small basins. Settlements are confined to the basins and lower slopes. Olives are the most characteristic crop in this district. Mount Carmel, a northwestward extension of the Samarian uplands, reaches the Mediterranean Sea south of the Bay of Acre.

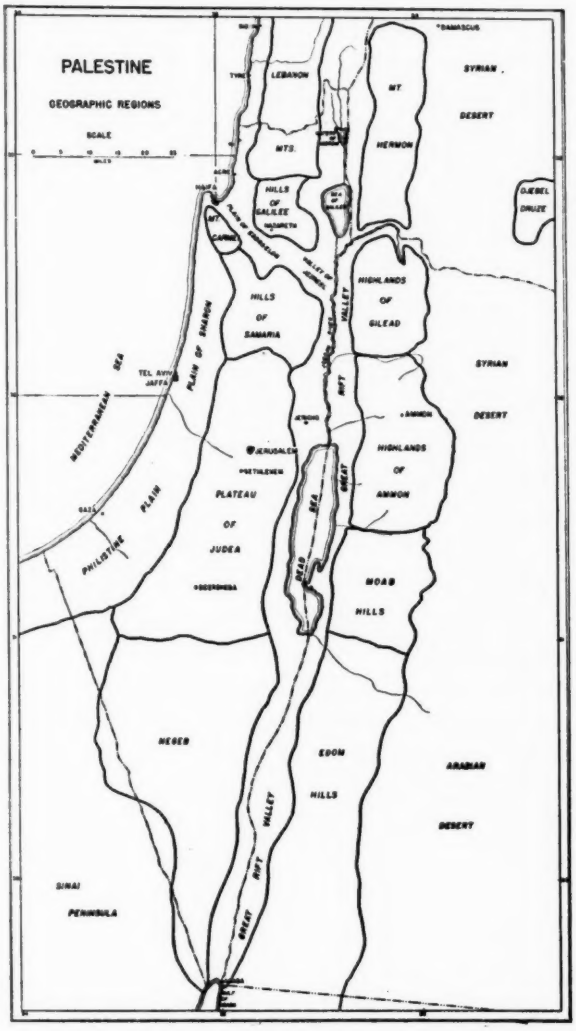

FIG. 1

The so-called Plateau of Judea, south of Samaria, is a large peneplaned fault block tilted toward the west. Altho dissected by deep valleys, its upland character is well preserved. The population, here, is fairly dense, and the section is an important olive and grape producer. Several important settlements, such as Jerusalem, Hebron, Bethlehem, and Beersheba mark the Judean Plateau.

To the south of the Plateau stands the desolate looking Negeb. Its lack of regular precipitation makes it habitable only by seminomadic Arabs. Southward the Negeb widens into the Uplands of

the Sinai Peninsula. The mineral resources of this district are considerable, but the Arab population is very sparse and chiefly engaged in nomadic grazing.

The Rift Valley. The great Rift Valley is a deep fault furrow or graben extending from Syria to the Red Sea. The southern end of the Valley is occupied by the Gulf of Aqaba, but from there north to Syria it is occupied by the Jordan River and its three lakes. These are Lake Hule (Waters of Merom), Lake Tiberias (Sea of Galilee), and the Dead Sea. From Lake Tiberias southward, much of the Rift Valley lies below sea level. The Dead Sea is bitterly salt. The upper Jordan Valley is irrigated, the Jordan district being famous for its date gardens and, more recently, for its banana plantations.

The Trans-Jordan Highlands. East of the Rift Valley with its lakes, stand the Trans-Jordan Highlands. These form a transition between Cis-Jordanic Palestine and the Syrian Desert. At the north, stands the Mount Hermon fault block—sometimes known as Djebel Hauran. Rich soil and an abundant winter rainfall produce good grain crops and pastures.

South of Mount Hermon are the Highlands of Gilead. On the west these terminate in a ragged fault scarp, but on the east they extend to Djebel Druse and the desert plains. The higher elevations carry evergreen groves; the slopes are grass covered; while the valleys support orchards and vineyards.

Farther southward, the Highlands of Ammon and the Hills of Moab form the southeastern limit of agriculture. Nomadic grazing predominates, with agriculture found only in a few small oases. The Edom Hills at the extreme south are a parched desert wasteland.

HISTORICAL PALESTINE

The Hebrews first appeared in Palestine (Land of Canaan) 4,000 to 3,800 years ago. It was not, however, until the time of Joshua (circa 1200 B.C.) that conquest and large scale settlement was undertaken. Jehovah reportedly had earlier said to Moses, "This is the land which I swore unto Abraham, unto Isaac, and unto Jacob, saying, 'I will give it unto thy seed.'" Whereupon Moses issued a command that the land be divided among the twelve tribes of Israel (the Hebraic people). These twelve tribes are legendarily explained as the descendants of the twelve sons of the early Semitic patriarch Jacob. In the actual division of the

land, however, the tribe of Levi, which constituted the priesthood, received only a designated list of towns scattered over the countryside. To offset this, the descendants of two of Jacob's grandsons (Ephraim and Manasseh, the sons of Joseph) were each given a son's share in the territorial division (see Fig. 2).

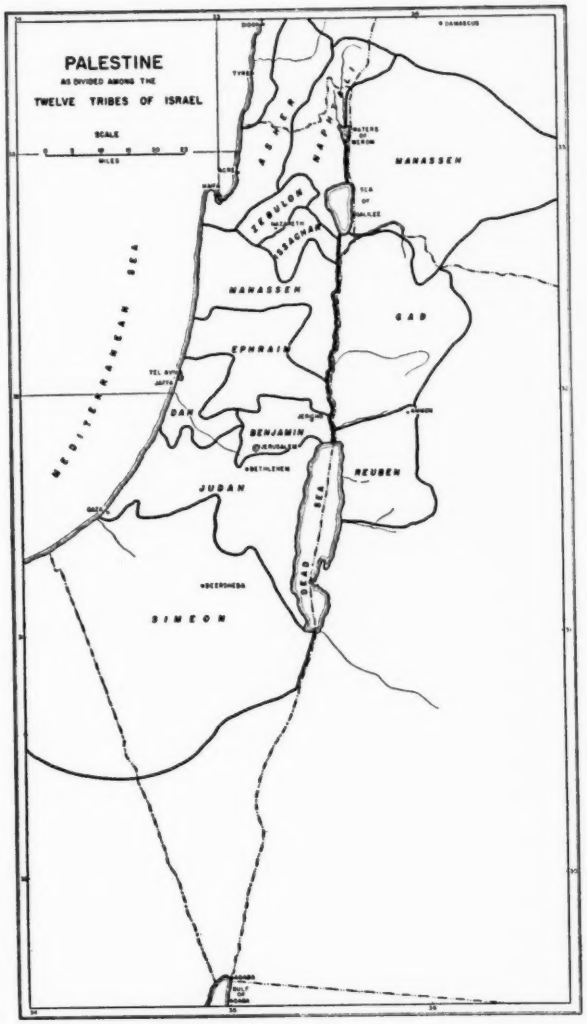

FIG. 2

At Moses' command, Asher, Zebulon, Naphtali, Issachar, and half of the tribe of Manasseh were settled in the north; Ephraim, Dan, Simeon, Benjamin, and Judah were settled in the south; Reuben, Gad, and the other half of the tribe of Manasseh were allocated lands east of the Jordan.

"And Moses sware on that day, saying, 'Surely the land whereon thy foot hath trodden shall be an inheritance to thee and to thy children forever, because thou hast wholly followed the Lord my God.' "[1]

This division of territory and the subsequent settlement of the land marked the beginning of Hebrew nationality. Palestine, however, was an open corridor between Mesopotamia and Egypt, and it would have required immense military strength to have held it permanently and

[1] *Joshua* 14:9.

in its entirety. For the most part, invading armies kept to the coastal lowlands and from these latter the Israelites or Hebrews were repeatedly repulsed and driven back to the highlands. After many centuries only the tribes of Judah and Benjamin, in the comparative inaccessibility of the Judean Plateau, survived.[2] Eventually, these were crushed by the might of Rome and dispersed over the Roman Empire.

From then on, Palestine was variously held by Romans, Byzantines, Marmelukes, Crusaders, and Turks. Thruout much of this time there were at least a few small colonies of Jews in the Holy Land. Thus, the Jews have had a much longer continuity in Palestine than any other people.

Political Palestine

In modern times, Jewish colonies began to be established in Palestine as early as the fifteenth or sixteenth century. Most colonization has, because of the pogroms and other persecutions, first in Russia and then in Western Europe, taken place within the last eighty years. After the First World War, one of the world's most pressing problems was that of finding a haven for the Jews of Europe. Indeed, the problem went beyond that, namely to find a homeland where the Jews would have the chance to establish a national state wherein they could become a majority and thereby eventually make persecution an impossibility. Since Palestine had just been wrested from Turkey, one of Germany's war partners, the opportunity to make Palestine the Jewish homeland presented itself.

The question of the political control of Palestine has been, from the outset, the most serious problem. The League of Nations realized that to turn the government over to either the Jews or the Arabs would bring immediate discord. The Arabs were uneducated and had had no experience in self-government. Moreover, the Arabs, as such, had never governed Palestine. The Jews, on the other hand, were distinctly in the minority.

In view of this situation, there was but one course for the League to take: to put some strong Western Power in charge of the mandate. Britain was selected because of its interest in the Suez Canal and because it was strong enough to maintain order during the era of immigration and education of the natives in self-

[2] And hence the name Jews for their descendants.

government. Great Britain, as administrator of the mandate, was ordered to carry out the terms of the Balfour Declaration of 1917 which guaranteed the establishment of a Jewish National Home.

In setting up the mandate, however, large sections of physiographic Palestine were lopped off. Sinai was given to Egypt; Northern Galilee and Mt. Hermon (Djebel Hauran) were given to Syria; later, all of Palestine east of the Jordan was set up as a separate Arab state, known as Trans-Jordania.

The Arab-Jew relations deteriorated steadily from 1922 to 1937, whereupon the British Government declared that there existed an "irreconcilable conflict between the aspirations of the Arabs and those of the Jews in Palestine," and that this could not be settled under the terms of the mandate.

By 1937, the Jewish population of Palestine had increased 700 per cent, whereas the Arab population had increased perhaps 300 per cent. Despite this, the Jews were still in the minority. The British White Paper of 1939 practically put an end to Jewish immigration at the very moment when a Zionist haven for European Jewry was most needed. Had the "Holy Land" been open to Jewish immigration from 1939 on, there can be little doubt that the area would now contain a Jewish population numbering between two and five million. The 1939 White Paper, therefore, was tantamount to subjecting the "Jewish National Homeland" to permanent Arab rule.

In addition to religious fanaticism on both sides, there were numerous economic grievances on the part of the Arabs as well as the Jews. Palestine's business structure involves two distinct but closely intertwined economies—one Jewish and the other Arab. The Arabs are primarily engaged in grazing and small-scale subsistence farming. The Jews are engaged in intensive and scientific cash-crop agriculture and small industries. The latter's modern Western manner and standard of living have upset the Arabs with their strong desire to maintain their traditional patterns of life.

These stresses produced an increasing chain of violent acts by both Arabs and Jews. British deportations of recent Jewish immigrants led to open revolt by some elements of the Jewish population. Eventually Britain referred the whole Palestine problem to the United Nations on February 7, 1947.

Anticipating increasing disorder in the future owing to the widening Arab-Jewish breach, the United Nations voted to partition already-pared-down Palestine into Arab and Jewish states on

November 29, 1947 (see Fig. 3). This proposed partition is based as closely as possible upon the present regional distribution of Arabs and Jews in the area, but it will create a difficult situation economically.

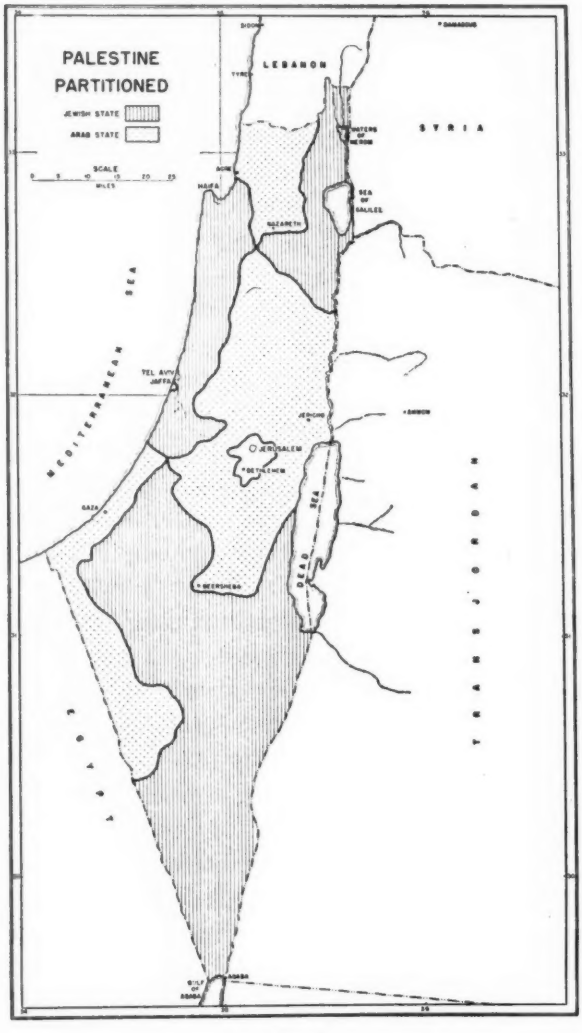

Fig. 3

The new Jewish State will contain most of Palestine's industry, whereas the Arab State will include the richest agricultural lands, the best grazing lands, and so much of the Jordan River as to make impossible any development of a "Jordan Valley Authority." Jerusalem and environs is to be set up as a third state under international control.

The Jews accepted this plan without approbation and have gone ahead at the task of setting up a government for their state. The Arabs neither accepted nor approved the plan. Instead, an Arab army began massing just outside the borders of Palestine. So threatening did this latter become that on March 19, 1948, the United States delegate to the United Nations proposed that the official plan to partition the little country be postponed and hinted that it might even be abandoned.

No one at this time can foresee what will transpire in Palestine.

The original League of Nations plan may be carried out, or the United Nations' proposal may eventually be effectuated. Or, again, the area may continue to be a football in the game of power politics.

SELECTED REFERENCES

1. "Assembly Adopts Plan for Palestine," *United Nations Weekly Bulletin,* Dec. 9, 1947.
2. Bowman I., *The New World.* New York: World Book Company, 1921.
3. Cornill, C. H., *History of the People of Israel.* Chicago: Open Court Publishing Co., 1899.
4. Kallner, D. H., and Rosenau, E., "The Geographical Regions of Palestine," *The Geographical Review,* January, 1939.
5. Kiepert, Heinrich, *Atlas Antiquus,* Berlin.
6. Laski, Harold J., "Power Politics Spells War," *Nation,* Oct. 4, 1947.
7. Meek, T. J., *Hebrew Origins.* New York: Harper and Brothers, 1936.
8. "Progress of Palestine Commission," *United Nations Bulletin,* Feb. 1, 1948.
9. United Nations Special Committee on Palestine, *Report to the General Assembly,* New York, 1947.

IS THE FUEL SHORTAGE PERMANENT?

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The press of the nation frequently carried headlines last winter (1947-48) relative to fuel shortages, and as prices have risen for fuels, along with those of other commodities, all of us have been affected either directly or indirectly. This is a timely topic in which all people are interested. The press also headlined severe temperatures for various parts of the country, and has emphasized the sufferings in those areas, as well as the disruptions in industry, that have resulted from fuel shortages.

WEATHER CONDITIONS HELP TO ACCOUNT FOR FUEL SHORTAGE

The severe weather of the winter was a big factor in the fuel shortage—even to the closing of industrial plants—but it was not the sole cause. According to the February 7, 1948 issue of *Business Week,* 250,000 people were temporarily jobless as the result of the diversion of gas from industrial plants to homes for heating purposes. Temperatures of 50° F. below zero—readings that approximated the lowest ever recorded for this country—were reported

for the northern part of the United States. The prevalence of low temperatures may be verified from reports of the United States Weather Bureau, which stated, for example, that during the month of January Pittsburgh had a deficiency of 7° F. per day, New York City had a deficiency of 12° F. per day during this same month, and Cleveland experienced a temperature average of 12° F. below normal for the same period of time. Such temperatures obviously required additional amounts of fuel for heating purposes even tho shortages already existed. Those low winter temperatures resulted from the invasion of great masses of polar air that originated in regions where winter temperatures are extremely low. As the air masses moved into the United States, they came over areas already covered with snow, and as a result, their temperatures were not modified to any great extent until they had moved into the southern borders of the country.

Climatic records do not show any marked or regular climatic changes. Some climatologists claim that our climate runs in cycles, others would have us believe that we are entering a period of general change, but the fact remains that the records do not bear out any definite cycle of recent climatic trends. The records are too short and too many variations are present to prove that climatic changes occur in a lifetime.

Our knowledge of air mass movements is too limited, at present, to make long range forecasts accurately. If, and when, such can be made they certainly will be an aid in planning for the production and distribution of fuels. The methods for making such forecasts accurately are yet to be perfected.

The climate of any area as we now use the term—the average or composite weather over a period of 35 or more years—gives at best only a general picture of weather conditions. Details are wholly lacking, and it is these details that give the actual conditions that one would experience in a given area. For example, the average January temperature in Miami is 66° F.; for Pittsburgh, the January average is 31° F. These figures do show that average temperatures for January in Miami differ from those in Pittsburgh for the same period, but they do not, in themselves, reveal that Miami has experienced frost, nor that the temperatures in Pittsburgh may drop, as they sometimes do, to 15° and 20° below zero.

Valuable data pertaining to the variability of weather can be obtained from weather records, such as: absolute maximum and

minimum temperatures, conditions of humidity, wind velocities, number of days below freezing, and similar data. There is a direct relationship between these factors and the supplementary fuels that would be needed in any locality for comfort.

EXPORTS OF FUEL HAD LITTLE EFFECT ON FUEL SHORTAGE

We have been prone to place the blame for our shortages in fuels on our export trade, especially shipments to Europe. A close examination of our export quotas of coal and petroleum products released by the United States Department of Commerce, the Office of International Trade is quite revealing. For the last three months of 1947, our total shipments of petroleum products outside of the United States was equal to less than one per cent of our domestic production. During that same period, we imported over twice the amount of petroleum that we exported.

Our exports of coal have been more significant for the same interval. Prior to the war we exported about three per cent of our coal production, but during the war that figure jumped to five per cent. Our total export tonnage of coal had risen, but because larger quantities of coal were being mined, the percentage of the total production that was exported remained the same. While our export trade in fuels was important, it had not increased in proportion to our increases in production. It is true that if we had kept the coal and petroleum at home it would have eased our fuel shortage, but it should be remembered that dynamic forces caused the shortages and export trade should not be considered a new causative factor.

INCREASED CONSUMPTION OF PETROLEUM AND PETROLEUM PRODUCTS

Severe winter temperatures greatly increase the demand for fuels. Moreover, our consumption of oil has risen from 367 gallons per capita in 1938 to 608 gallons in 1947. So the picture is more involved than it would appear to be at first. The increased use of hydrocarbons was definitely one of the contributing factors to our fuel shortage. Of the total energy derived from major sources in the United States at the present time, one-half is from coal, more than one-fourth from oil, and over one-tenth each from natural gas and water power. While coal is still our chief source of energy, the rise in the consumption of oil has been phenomenal.

According to the National Petroleum Council, there was a notable augmentation from 1941 to 1947, not only in the number of consumption units in use, such as cars, trucks, oil burners, tractors, space heaters and diesel locomotives; but also, in the percentage of petroleum products consumed, such as gasoline, kerosene and heating oil.

Demand in relation to supply was highest in light fuel oil. Consumption of heating oils increased almost 69 per cent between 1941 and 1947. Home owners have been installing heating units at the rate of a half million a year, each of which burns about 1500 gallons per year. Diesel locomotives constituted a still larger category of units using heating oil. The number of diesels in use increased over 411 per cent between those same years. Everyone knows what was back of the 20 per cent increase in the consumption of gasoline. It is a simple matter for one to recall the trend toward additional mechanization of agricultural operations, and the acceleration of peace time travel via plane and auto. Additional quantities of petroleum and petroleum products have been used in the manufacture of insecticides, fungicides, synthetic rubber and thermoelectric power.

Severe Winter Weather Handicapped Distribution

The severe weather of our past winter not only increased the demands for fuel at a time when consumption exceeded production, but it also hampered distribution. Heavy snows interrupted highway and rail transportation, and low temperatures closed important inland waterways which are normally used to transport great quantities of coke, coal and oil. Industrial and urban centers, depending upon such means of transportation, were faced with short fuel supplies, even to the extent of closing some plants. This occurred at a time when steel was badly needed for the construction of additional facilities to produce and transport fuels.

The waterways that are especially important for the movement of fuels are the Hudson, the Mississippi, the Ohio, the Monongahela and the Great Lakes. The Monongahela, for instance, was closed more than twice as long as its normal period of approximately two weeks. This river, connecting the coal producing areas of West Virginia and western Pennsylvania with the Pittsburgh iron and steel district, carries a greater cargo tonnage than any other inland waterway excepting the Great Lakes. In 1941 it was used to trans-

port over 40,000,000 cargo tons of which coal, coke and oil made up over 95 per cent of the total.

SHORTAGE OF PRODUCTION AND TRANSPORTATION FACILITIES

It was the shortage of pipe lines, tankers, and refining equipment, not a diminution of the supplies of oil or natural gas that was largely responsible for the fuel crisis. For example, a scarcity of pipe was limiting not only the amount of fuel that could be moved from West Texas wells to refineries in the Mid-West, but also was one of the factors delaying work on the pipe lines in the Middle East. A shortage of tankers and tank cars limited the movement of fuel from surplus to deficit areas.

About 10 per cent of the total steel produced over the past decade has been used for pipe and tubes. We picked up our newspapers February 19, 1948 and learned that the Nation's steel producers simultaneously announced an increase of $5.00 a ton (which amounted to about a 10 per cent increase) in prices for structural and semifinished steel (girders, slabs and bars). Steel men attributed this increase in price to the higher costs for such raw materials as coal, fuel oil, zinc, tin, refractory clay and steel scrap. Steel consumers from coast to coast greeted the rise in steel prices with the observation that there was no question that the costs of a broad line of industrial products would have to be reexamined for probable price revisions. The rise in steel prices retarded production of additional refining and transportation facilities at a time when they were badly needed for alleviating the fuel shortage.

ENERGY SUBSTITUTES AS A SOLUTION TO THE PROBLEM

Alternative sources of energy fall into five categories, namely, gasification of coal, liquification of natural gas, processing of oil shale deposits, alcohol from starch bearing plants, and the manufacture of silicone oils and greases.

Since our coal reserves in the United States are great and capable of lasting us over 200 years at a two per cent annual yearly increase in production, we will probably adopt and modify the German, Fisher-Tropsch process of gasifying coal and the production of petroleum-like products. The Germans processed enough coal using this method to produce the necessary liquid fuels to fight this past war. The most outstanding feature of this process is its low cost.

The Illinois Institute of Technology has indicated that synthetic petroleum can be produced by processing the natural gases. According to the Institute, this process would be capable of producing over five per cent of our present petroleum needs. Plants have been started in Texas and Kansas to apply this method in the production of synthetic gasoline.

Oil bearing shale deposits are extensive and we recognize them as a great potential source of petroleum. The present known methods of extracting petroleum from oil shale produces a product of inferior quality to natural oil and at a higher cost. With additional research we should be able to improve the quality of the petroleum and reduce the cost.

The field of synthetic oil and grease production from silicate sand is a relatively new enterprise. This new class of synthetic is called silicones. Certain types of superior oils and greases can now be produced by this method. The future looks promising.

Starch producing plants can be utilized for the manufacture of alcohol of a quality suitable as a fuel. If starch producing plants are in plentiful supply and not needed for food we might find an important alternative source along these lines.

In addition to the direct alternative sources of energy we should not neglect to mention some of the substitutes, for example, extension of hydroelectric power production, atomic power, and the harnessing of solar energy, tides, volcanic energy and winds.

Conservation Measures Necessary in the Long Run

Conservation is efficient use—not non use! There are many ways by which a more efficient use of resources, including fuels, could be put into practice. This would result in big savings in a plan looking to the future. Only a few will be mentioned.

In the methods of production there should be fewer oil wells per unit area, regulated drilling, horizontal and deeper drillings, use of water and gas to increase pressure, thus forcing a greater amount of oil from the sand, and increased efficiency in refining. Somewhat similar ideas could be used in the production of coal—even to the extent of gasifying it. Certainly the coal should be mined more completely before the mines are abandoned.

Likewise, there should be a more efficient use of the fuels themselves. The use of diesels rather than coal burning locomotives is an illustration. Engineers tell us that the diesel locomotive has an

efficiency of over 29 per cent as compared to approximately 7 per cent for the coal burners. Moreover, there are great quantities of gasoline spilled while filling tanks of the more than 30 million motor vehicles. In southern Illinois natural gas fires have been burning as a waste product in that oil field for the past 30 years. It may be that the pressure is too low in this field to pipe the gas long distances to be used as a fuel, but it could be forced back into the rock to increase the flow of oil instead of being burned as a waste. At a time when many people were uncomfortably cold, when industry was forced to shut down from lack of fuel, and when prices of fuels were skyrocketing in part, at least, from shortages of fuels, such wastes are criminal.

INCREASED PRODUCTION NECESSARY

It is common knowledge that exploration and drilling for petroleum in the United States was reduced during the war with the result that peacetime consumption has been running ahead of supply by some 100,000 barrels per day.

There seems to be general agreement that our actual reserves may be two or three times the proved reserves of twenty billion barrels. There are still opportunities to open up new wells thru deeper drilling, and thru the development of the oil pools within the continental shelf, that part of the continental platform which continues underneath the waters of the oceans and gulf to a depth of about 600 feet.

We must look more and more to foreign sources of oil. There are several large areas in the world in which most of the world's oil has been found. The areas referred to are the Eastern Mediterranean Basin, the Caribbean Basin, the Far East Basin, and the North Polar Basin. Incidentally, United States companies have interests in each of these areas.

The Caribbean Basin, comprising lands bordering the Gulf of Mexico and the Caribbean Sea, is the largest producing region outside of continental United States, with a proved reserve equal to that of the United States.

The islands of the East Indies lie within the Far Eastern Basin. While they rank rather low as oil producing nations, they have proved reserve of one billion barrels.

The North Polar Basin, where oil seeps have long been known, offers a challenge to petroleum geologists.

The Eastern Mediterranean Basin, made up of the lands around the Caspian Sea, the Red Sea, the Black Sea, and Persian Gulf, is the most significant world region from the point of view of petroleum potentialities. The proved reserves are enormous, some twenty-seven billion barrels. This figure, of course, excludes the U.S.S.R., since those reserves are unknown to outsiders. The Middle Eastern reserves are the largest reserves in the world. American companies have large concessions in Saudi Arabia, in fact, their concessions cover about half of the country. The Trans-Arabian Pipeline from Dhahrain, on the Persian Gulf, to Port Sidon, on the Eastern Mediterranean shore of Lebanon, has been held up due to controversial issues in the Middle East. The geographic significance of this oil to the United States is that once it starts flowing, it will ease the shortage in the United States and, at the same time, will prolong our reserves.

Future Prospects of Our Fuel Situation

The efficient use of resources, including fuels, would function more effectively in a long range plan but, for the immediate future, the fuel shortage is likely to become worse rather than better. We should, however, emphasize a more efficient use of all resources, including fuels, since prices will inevitably rise as resources approach depletion.

We have confidence that science will ultimately develop other sources of power before our fuels become exhausted, but in the meantime, we should use wisely those fuels that are now at our disposal.

"As steel goes, so goes the nation" is an axiom in our American economy. Therefore, the role of steel is a very important one in relation to our fuel crisis. With the increase in steel prices, it would seem that prices of steel for pipe lines and refining equipment might also go up in price. One can anticipate that manufacturers may be reluctant to expand fuel production, thus demand may exceed supply for some time yet, and perhaps two or three years may pass before the petroleum and natural gas industries have sufficient new equipment to keep pace with rising demand.

There are also some important political questions that relate to the fuel situation and its early solution. We must recognize that much of the future is related to Europe itself. When Europe gets

back on its feet, we can expect our exports to return to the prewar status.

It has already been indicated that we are going to find it necessary to look more to foreign sources for our petroleum needs. The Near East will be one of our more important sources. While American capital now controls much of the oil of the Near East, we must recognize the fact that this area is politically unstable. Production is being held back there not only because of lack of steel and machinery for production facilities but also by the political unrest in the area.

Several aspects relating to the future of the fuel question have been indicated and all factors lend themselves to the conclusion that we can be assured that, given time, industry and technological progress will solve the problem of the shortages.

SELECTED REFERENCES

"A Look at the Oil Situation," *The Lamp,* 30, No. 2, (March, 1948), 1-6.

"Coal Distillation Advances a Stage," *New York Times* (February 14, 1948).

"Cut in Coal Shipments Abroad," *World Report,* 3, No. 21, (November 18, 1947), 24-25.

Daniell, Raymond. "By 'Flying Carpet' to Arabia's Oil Fields," *New York Times Magazine,* (January 18, 1948).

Haussman, Frederick. "Latin American Oil in War and Peace," *Foreign Affairs,* XXI (January, 1943), 354-61.

Mather, Kirtley F. "Oil Troubles the International Waters," *New York Times Magazine,* (February 22, 1948), 7 ff.

Mather, Kirtley F. "Petroleum—Today and Tomorrow," *Science,* 106 (December 19, 1947), 603-9.

"Need for Reserves in Liquid Fuel Seen," *New York Times,* (August 3, 1947).

Petroleum: Facts and Figures (8th ed.). N.Y.: American Petroleum Institute, 1947.

"Pressure for Shift to Coal," *U. S. News and World Report,* XXIV, No. 8 (February 20, 1948), 19.

"Shortage of Oil," *Fortune,* XXIX, No. 1 (January, 1944), 90 ff.

Standard Oil of New Jersey. Petroleum in the World, Conservation, Oil for the World, Standard Oil Company (New Jersey) and Middle Eastern Oil Production, Natural Gas, Looking Forward in Oil, Rubber from Oil.

"Synthetic Oil: Next Big Industry?" *U. S. News and World Report* XXIV, No. 6 (February 6, 1948), 42-43.

U. S. Dept. of Interior, *Minerals Yearbook 1945,* Washington, D.C.: U. S. Government Printing Office.

The World Geography of Petroleum, (A cooperative study by twelve authors). N.Y.: American Geographical Society.

Voskuil, Walter H. "Oil After the War: A Review," *Geographical Review,* 34, No. 4, (October, 1944), 655-660.

"Why Oil is Running Short," *U. S. News and World Report,* XXIX, No. 14 (February 2, 1948), 46-49.

"World Facing Acute Shortage of Oil," *World Report,* 2, No. 23 (June 10, 1947), 5-6.

WIND DIRECTIONS—PUERTO RICO

F. A. CARLSON
Ohio State University

The text, air movement, is introduced, generally, to students of geography in grade schools as well as in colleges with a discussion of the Planetary or Earth's Wind Systems. A schematic representation labelled "As it might be" is prefaced with the statement that the earth's primary air circulation is complex and that the analysis might be simplified by proceeding from the simple to the less complicated forms. Hypothetical conditions, such as a non-rotating planet, a homogeneous surface, and vertical rays of the sun always

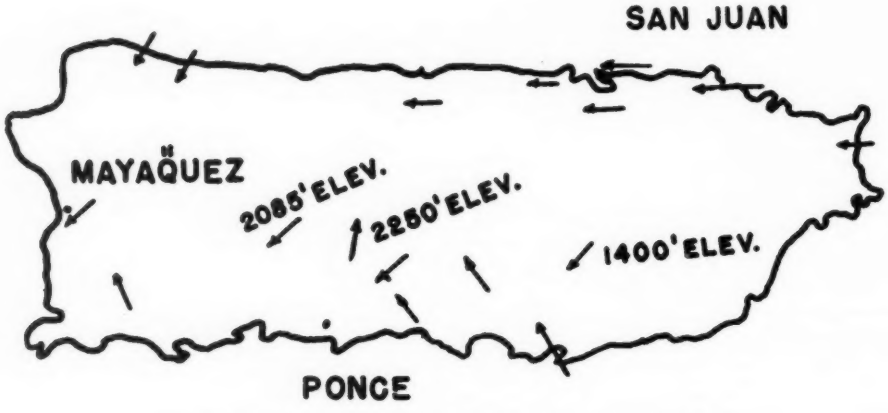


FIG. 1. Prevailing Annual Wind Directions, Puerto Rico.

at the equator, are presented on the assumption that the physics of air movement may be better understood on the basis of suppositions than thru an initial consideration of known realities.

In fact, the entire subject of Planetary Air Circulation warrants re-examination. Does it, the so-called General or Primary Air Circulation, constitute a background upon which all other air movements are superimposed? Is it any more primary than the Polar or Tropical Air Masses? Probably, the weakness is not in terms of the generally accepted fundamentals of the General Air Circulation but rather in the application of the Earth's Wind Systems. For example, a typical paragraph selected from a book in the field of geography includes in substance the statement "In the low latitudes, approximately 30° north and 30° south, between the dol-

drums and the belts of higher pressure, the Horse Latitudes, are found the Trade Winds, air moving from the high pressure areas toward the equator. As they move equatorward, they are deflected and become northeast trades in the Northern Hemisphere and southeast trades in the Southern Hemisphere.'' Obviously the above quotation is a gross generality when applied to most specific places and calls for considerable qualification.

Puerto Rico presents one of innumerable illustrations of the limitations of the application of the General Air Circulation. Figure 1, Prevailing Wind Directions in Puerto Rico, shows the annual dominance of east and northeast winds in northern Puerto Rico and southeast winds in the southern portion of the Island. The

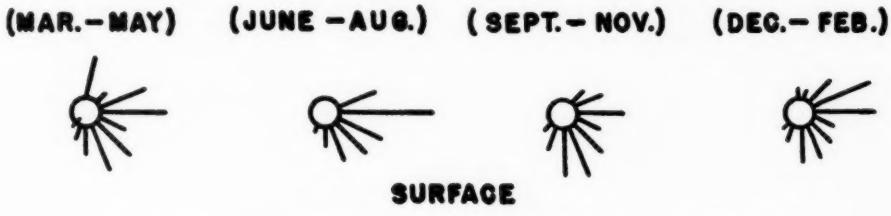


FIG. 2. Prevailing Seasonal Wind Directions, San Juan, Puerto Rico.

local controls, obviously, include location, insularity or distribution of land and water, landforms, and elevation. Further evidence is revealed in Figure 2, Wind Roses—San Juan, Puerto Rico, that the doctrine of prevalency of the average annual winds needs additional clarification. The diagrams portray the seasonal variations in surface wind directions. In general the wind at San Juan is predominantly from the east thruout the year. However, occasionally during the winter or low sun months northeast winds are active and may become the dominant winds in some months.

Another important fact is shown in Figure 3. During the period of the day, generally, from about 9 A.M. to 9 or 10 P.M. the air movement at San Juan is from the east, an on-shore wind, while the remainder of the twenty-four hour day, night and early morning, the wind is southeast or off-shore. Similar conditions prevail, generally, along the entire northern coastal region of Puerto Rico. On the south coast there is also a diurnal variation tending to bring about southeast winds by day and northeast winds at night. The velocity of the sea-winds is generally 8 to 16 mph., being twice as great as the land winds. Generally, the on-shore winds are

strongest in July and lightest in October. High winds are not common except in association with tropical disturbances or Hurricanes.

The changing patterns of wind directions in Puerto Rico, daily, seasonal, and annual, clearly indicate the significance of the local

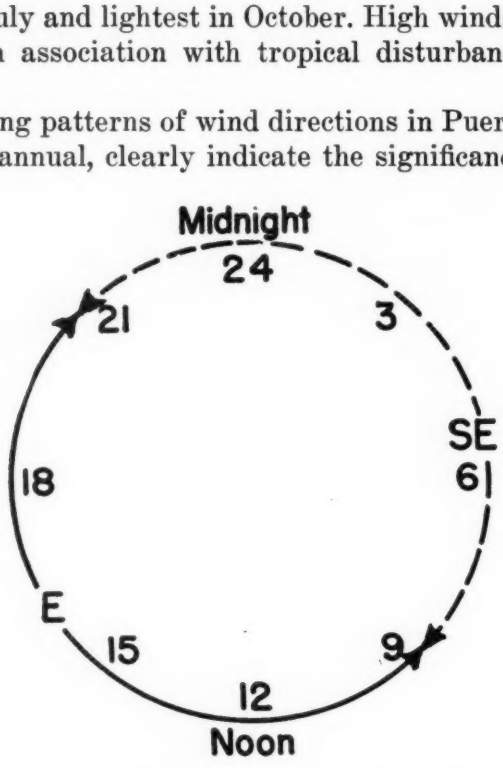


FIG. 3. Prevailing Daily Wind Directions, San Juan, Puerto Rico.

controls. On the basis of the Planetary Wind System, without a consideration of local disturbances, the erroneous assumption might be that the prevailing winds thruout Puerto Rico are northeast trades. Recommendation is, probably, in order to delete all references to the General Air Circulation where it is presented on the basis of suppositions. Is there any logical reason why the fundamentals of air movement cannot be clarified in terms of known realities?

JOURNAL OF GEOGRAPHY PRIZES

In January, 1947, we had the pleasure of announcing a series of prizes, to be awarded to contributors of outstanding articles that have appeared in the JOURNAL OF GEOGRAPHY. These prizes are made possible by the generous contribution of one of America's eminent geographers who insists that he remain anonymous. He is convinced: 1) "That the fine service contributed over the years by the *editors* of the JOURNAL merits far more recognition than it has received. These prizes honor them. 2) That the receipt of the prizes by the authors of the articles judged best will encourage these authors and other authors, with the result that additional excellent manuscripts will be offered for publication in the JOURNAL. 3) That public recognition of worthy achievement will help not only those who receive the recognition but also those who participate in any way. Indeed the public will think better of geography and of the JOURNAL when it learns of these prizes." Under the terms of the gift the President of the National Council of Geography Teachers is directed to appoint committees to make the award. The President is *ex officio* a member of each committee. Eight awards have now been established in honor of the following: Richard E. Dodge, Ray H. Whitbeck, George J. Miller, J. Paul Goode, Almon E. Parkins, Ellsworth Huntington, Isaiah Bowman, and Cora P. Sletten.

ALMON E. PARKINS PRIZE, 1948

Dr. Parkins was an associate editor of the JOURNAL for many years, past president of the National Council of Geography Teachers, author of elementary textbooks, and joint editor of "Our Natural Resources and Their Conservation." The prize in his honor is for an article published in the JOURNAL within the last decade on the subject of conservation, or some study of the South. The prize was awarded, at the recent Chicago meeting of the National Council, to Dr. J. R. Whitaker for his article on "International Aspects of Conservation," which appeared in April, 1944. The judges were Dr. E. E. Lackey, Dr. Douglas C. Ridgley, Dr. Earl Shaw, Dr. Loyal Durand, and Dr. Thomas F. Barton.

ELSWORTH HUNTINGTON PRIZE, 1948

Dr. Huntington's contributions to the advancement of geographic education are legion. Like Dr. Parkins he received the Distinguished Service Award of the National Council and served as president of the Association of American Geographers, and he was a frequent contributor to the JOURNAL. The prize in his honor is for an article or series of articles on Eurasia, or on climate, and published in the JOURNAL within the last decade. The prize was awarded to M. Melvina Svec, at the recent Chicago meeting, for her series of articles on Eurasia. The judges were Erna Grassmuck Gilland, Dr. J. R. Whitaker, Dr. Earl Shaw, Dr. Loyal Durand, and Dr. Thomas F. Barton.

PRIZES FOR 1949

Two prizes will be awarded in 1949 for outstanding articles published in the last five years in the JOURNAL. The Isaiah Bowman Prize is to be for a paper dealing with political geography, South America, or Pioneer Regions. The Cora P. Sletten Prize is for a paper by a woman, or for three or more reviews by the same author. Dr. Bowman was editor of the JOURNAL for two years; Miss Sletten was assistant editor for twenty-three years.

The staff of the JOURNAL wishes to again take this opportunity to express its great appreciation of the generous gift which has made the awarding of these prizes possible.

THE NATIONAL COUNCIL AT WORK

Preparation of Lists and Bibliographies on Still Pictures

The Executive Board has approved the appointment of a committee to prepare lists and bibliographies on still pictures. The Planning Committee recommended "that a committee of three be appointed to prepare or have prepared material suited to publication in leaflet form about still pictures, including textbook pictures, mounted photographs, slidefilms, filmstrips, and slides. The series should be selected from the following topics or from others approved by the Executive Board: 1) a list of filmstrips of use in teaching the geography of North America at the intermediate level 2) a bibliography of articles on the use of pictures in the teaching of geography."

Dr. Mary Jo Read, State Teachers College, Milwaukee, Wisconsin, is chairman, and Dr. Cyril L. Stout, Western Michigan College of Education, Kalamazoo, is secretary of this committee.

Nebraska Chapter of N.C.G.T.

The October, 1948 Bulletin of the Nebraska Chapter of the National Council of Geography Teachers announces the following officers: President, Professor Dale E. Case, Nebraska Wesleyan University, Lincoln; Vice-President, Professor Richard Diffenderfer, State Teachers College, Kearney; Secretary-Treasurer, Miss Erma Warta, University Extension Division, Lincoln; Bulletin Editor, Professor Esther S. Anderson, University of Nebraska; and State Coordinator, Professor Nels A. Bengtson, University of Nebraska.

On October 30, the Nebraska Council had a geography luncheon at the Student Union. The theme of the program was "International Goodwill." Miss Patricia Rivera, Lexington, Nebraska, spoke on "Mexican Lands and Peoples," and Mr. Juergen Herbst, Exchange Student from the British Zone in Germany, spoke on "Present Conditions in Germany."

Interested persons may secure five issues of the Bulletin of the Nebraska Council of Geography Teachers by sending twenty-five cents to Miss Erma Warta, 1746 "Q" Street, Lincoln.

Committee on Compilation of Suggestions and Bibliography for Use by Curriculum Committees

Miss Mamie L. Anderzhon, Oak Park High School, Oak Park, Illinois, is chairman of this new committee.

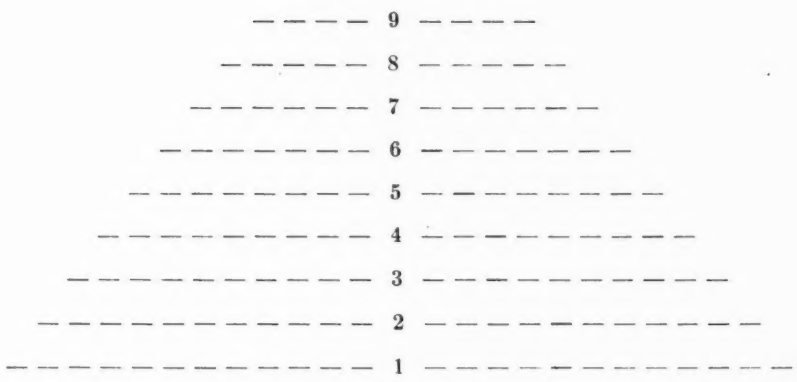
The Executive Board approved the appointment of this committee after the Planning Committee recommended "that a committee of three be appointed to prepare material designed to help curriculum committees. This committee is not to formulate or to recommend any one curriculum. It should: 1) prepare a bibliography of articles and other material; 2) prepare or encourage the preparation of articles suitable for publication in the Journal of Geography covering topics not already adequately discussed in print; 3) compile definite suggestions for procedures to be followed by committees or individuals engaged in such work; 4) prepare a list of state coordinators or other persons trained in geography who are willing to assist such committees in their states in an advisory capacity or to help committees to locate other such advisors; 5) prepare the material in the form most helpful to those who would use it and in accord with the plans of the planning and publications committees."

Miss Anderzhon's committee will start working on points one and four as soon as the entire committee is appointed.

Thomas F. Barton, *President*

SCALE THE HEIGHTS

Peaks *Mts.*



Insert the proper names of peaks and mountains in the above diagram according to the following descriptions. Each name has as many letters as there are dashes in the line.

PEAKS

1. A volcanic peak near Mexico City.
2. Located in Tanganyika Territory.
3. Located in central Ecuador.
4. A peak in the Andes in western Argentina.
5. Highest peak in North America in Alaska.
6. Highest point in the U. S. about 80 miles from lowest point.
7. The mountain upon which Noah's Ark supposedly landed.
8. A peak in Washington near Canadian boundary.
9. An active volcano in Sicily.

MOUNTAINS

1. Principal mountains in eastern U. S.
2. Ranges along the western U. S. coast.
3. Mountains in northeastern New York.
4. Mountains said to form the "backbone" of Italy.
5. Mt. Everest, the highest peak in the world, is located in this great range.
6. A range extending into Oregon, Washington and British Columbia.
7. Mountains in Bulgaria.
8. Located in Morocco and Algeria.
9. Noted for platinum in eastern Russia.

RALPH S. HARRIS
Westport High School
Kansas City, Mo.

EDITORIAL NOTES AND NEWS

On March 29, 1948 Phi Chapter, Gamma Theta Upsilon, National Professional Geography Fraternity, was installed on the campus at Stanford University. Mr. John Taylor is the sponsor of the new chapter. Phi Chapter had a charter membership of twenty-six students and faculty.

Psi Chapter, Gamma Theta Upsilon is now organized and, with a charter membership of twenty-five students, was installed November 19, 1948, on the campus of the University of North Dakota. Mr. Bernt Lloyd Wills is the sponsor of Psi Chapter. Ina Cullom Robertson, National Secretary and Treasurer for Gamma Theta Upsilon, installed the chapter.

DR. EARL E. LACKEY, who retired September 1, 1948, from the Department of Geography at the University of Nebraska is to join the staff of the Department of Geology-Geography of the University of Tennessee as visiting professor for the Winter Quarter of 1949.

The New Jersey Council of Geography Teachers held their annual meeting in Atlantic City, November 13, in connection with the New Jersey Education Association. Mr. LeRoy C. Hinkle, Dover High School, is president of the New Jersey Council, and Adelbert K. Botts, New Jersey State Teachers College, Trenton, is State Coordinator. This year the New Jersey Council of Geography Teachers joined with the New Jersey Council for the Social Studies and the Association of New Jersey State Teachers Colleges to sponsor a forum on "Developing Zeal for Democracy Thru Geography, Citizenship Activities, and Current History." Dr. Thomas F. Barton, President of the National Council of Geography Teachers, spoke in behalf of geography's contribution.

Canada, our neighbor to the north, may gain a new province in the joining of Newfoundland to the Dominion of Canada. Negotiations now under way point to March 31, 1949, as Canada's date for making Newfoundland one of the family. When Canada accepts the new province Canada's area will be increased by one twenty-fourth, or 152,734 square miles. This figure includes the 110,000 square miles of Labrador. By accepting Newfoundland Canada will gain one of the world's greatest fishing grounds and a growing wood-pulp and paper industry. Newfoundland's position, the nearest North American land to Europe, gives Newfoundland war- and peace-time importance.

A great shift from the use of the steam engine to the Diesel locomotive has been observed since the war. More than 90 per cent of the new locomotives on order are Diesels. The answer for this recent shift lies in the Diesel's high efficiency. The conventional steam engine is about 7 per cent efficient, the steam turbine from 25 to 30 per cent efficient, and the Diesel from 33 to 37 per cent efficient. The cost of a Diesel is twice as much as a steam locomotive capable of hauling the same load at practically the same speed. The Diesel's savings in operation will equal its purchase price within six to eight years and frequently in far less time than that. In 1945 it was estimated that 75 per cent of all steam locomotives then in service were more than 22 years old. The life expectancy of a steam locomotive is said to be thirty years and constant overhauling and replacement of parts is necessary. So far the Diesels have required very little loss of time for repairs. Railroads will put into use the type of locomotive which will yield the greatest return for the capital invested. Some of the factors to be considered are: initial cost, frequency of repair and cost of operation, thermal efficiency of the fuel required, and adaptability to traffic demands.

GEOGRAPHICAL PUBLICATIONS

Cartocraft Geography School Atlas. U.S.A. Edition of Philips' Modern School Atlas, edited by George Goodall; xxii and 104 pp., index. 1947. $4.00, 11½ x 9¼ inches. Distributed in the United States by Denoyer-Geppert Company, Chicago.

Denoyer's School Atlas with map reading suggestions. By L. Philip Denoyer. XXX and 32 pages, index. 1947. $1.35, clothbound, $2.40. 11 x 8½ inches. Denoyer-Geppert Company. Abridged Elementary Atlas $0.60.

The Cartocraft atlas shows the high quality workmanship typical of Philips' atlases over a long period of years. The text covers briefly the problem of map projections and other map qualities. Graphs showing temperature, pressure, and rainfall data cover typical stations over the earth. Eleven pages show world maps, with the hemispheric and interrupted homolographic projections predominating. Thirty-six pages are devoted to the map portrayal of Europe and the British Isles, giving excellent coverage. Fourteen pages are assigned to Asia, covering adequately the important portions of the continent. The more important aspects of Africa are treated in nine pages, Australia and Latin America occupy seven each. North America, north of Mexico, is covered in seventeen atlas pages. The atlas gives slightly more weight to the British Isles and European areas than comparable American atlases, and correspondingly less space to the United States. The index is adequate.

Denoyer's School Atlas may be said to cover the minimum essentials required in an atlas for general school use. Thirty pages of textual material, much of which is beyond the understanding of the later elementary school student, appear excessive. The greater space is devoted to the United States and Canada, but coverage is given the remainder of the earth. The map plates are excellent, not obscured by too great detail, while the colors used are pleasing. The index is adequate, but carries no aids to pronunciation of place names.

L. H. HALVERSON

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Marquette, Michigan

Joe Russell Whitaker. **Geography in School and College.** Bureau of Publications, George Peabody College for Teachers, Nashville, Tennessee. 1948. 116 pages.

After reading the 116 pages of this book, one admires the ingenuity of the author in his ability to include so much pertinent and timely material in so small a volume.

The book is a compilation of twelve papers which were written over a period of fifteen years. Despite this fact, there runs thruout the essays one main theme—geography in education—a theme which provides a remarkable degree of unity and coherence.

The organization of the book facilitates its reading and presents a coherent idea thruout its length. The well organized topics follow each other logically and leave the reader with the conviction that the author is a master of his subject and sincere in his convictions. Thruout the twelve chapters the need for broader world understanding and closer cooperation among nations is stressed repeatedly. The earth is today so completely occupied that an individual needs to consider himself a citizen, not only of his own country, but of the world as a whole. Examples, worldwide in scope, are presented in proof of the need for world interdependence and for a broader global understanding. Geography teachers, because of their association with and knowledge of world affairs,

are in a position to perform many services in educating people to global understanding. In this respect, geography provides a necessary worldwide framework of knowledge. It also helps us to understand how people are bound together and the ways by which nations are forced to take account of each other. Furthermore, geography provides a basis whereby an understanding and appreciation of the problems of other people may be secured.

However valid the above factors may be, their significance is lost without purposeful teaching. Numerous examples are cited to emphasize the danger of careless methods and thoughtless actions on the part of the teacher.

For those who desire to learn of the methods of purposeful teaching the last five chapters of the book offer valuable directions. Problems dealing with: "Change," "Where Places Are," "What Other Lands Are Like," "New Courses in Geography" and "Geographic Materials" are only some of the topics discussed.

The final paper deals with "The College Teacher's Search." Search for what? Among the more significant objectives stated are: valuable subject matter, the student's needs, ways by which students and subject matter may be brought together. Such objectives emphasize that the earnest college teacher's search is never ended.

The lack of an index is to be regretted because this little volume is packed with useful aids. Teachers of geography and closely related fields, as well as school administrators and supervisors and students, will find the book worthy of frequent reference.

G. DAVID KOCH

Indiana State Teachers College, Terre Haute

Leonard O. Packard, Bruce Overton and Ben D. Wood. **Geography of the World.** 488 pp., photographs, maps and diagrams. 1948. The Macmillan Company, New York. $4.00.

This text is the successor to *Our Air Age World,* and aims to acquaint the high school student with world geography and post war problems. The material is presented in Ten Parts, each Part divided into Units. Part One presents briefly such topics as rotation, revolution, latitude, longitude, time, seasons, weather, climate, winds, land and waters, maps and mapping, earth resources, etc. Following this general introduction, the world is presented continent by continent. More pages are devoted to the presentation of the United States than to any other political area. In all other instances, nations are handled very briefly.

The text is well illustrated with many new photographs, maps and diagrams. A series of political-physical maps of the continents appears in the Appendix, together with rainfall maps of the continents and the United States. Maps are distributed thruout the text. Many of these could be improved; for example, the series indicating the world distribution of minerals, and the maps showing United States airlines and railroad lines. In the discussion of the iron and steel industry of the United States there is need for distributive maps of the coal and iron ore resources.

The text presents many facts. It covers the earth but develops little appreciation of regional interdependence. The high school student needs much guidance in the use of facts.

VILLA B. SMITH

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